

THREAT OF THE LESSER KNOWN
INVASIVE PLANT SPECIES ON
ESTABLISHING DESIRED RIPARIAN
AND FLOODPLAIN VEGETATION

AMY SACRY, RESTORATION ECOLOGIST

GEUM ENVIRONMENTAL CONSULTING

WHAT IS AN INVASIVE PLANT?

- **SUCCESSFUL INVADER**
 - INTRODUCED FROM ELSEWHERE, NON-NATIVE
 - ESCAPES INTO NATURAL AREAS
 - PERSISTS AND SPREADS
 - GENERALLY LACKS NATURAL CONTROLS
- **CAUSES HARM**
 - DISRUPTS ECOSYSTEMS
 - OUT-GROWS, OUT-SPREADS AND OUT-COMPETES NATIVE PLANTS



Invasive plants such as *Tamarix* spp. displace native plants and wildlife and can transform entire ecosystems (Colorado River near Moab, Utah)

Rocky Mountain bee plant



spotted knapweed



Invasive
Plants

Noxious
Weeds

Ecologically-based concept

Legal, policy-based concept

WHAT THREAT DO INVASIVE SPECIES POSE?

Native Species Benefits



Clean, Cool Water
Plants filter pollution;
provide shade



Wildlife
Provide habitats and food to
support diverse native species



Erosion Control
Different root lengths
reduce soil erosion

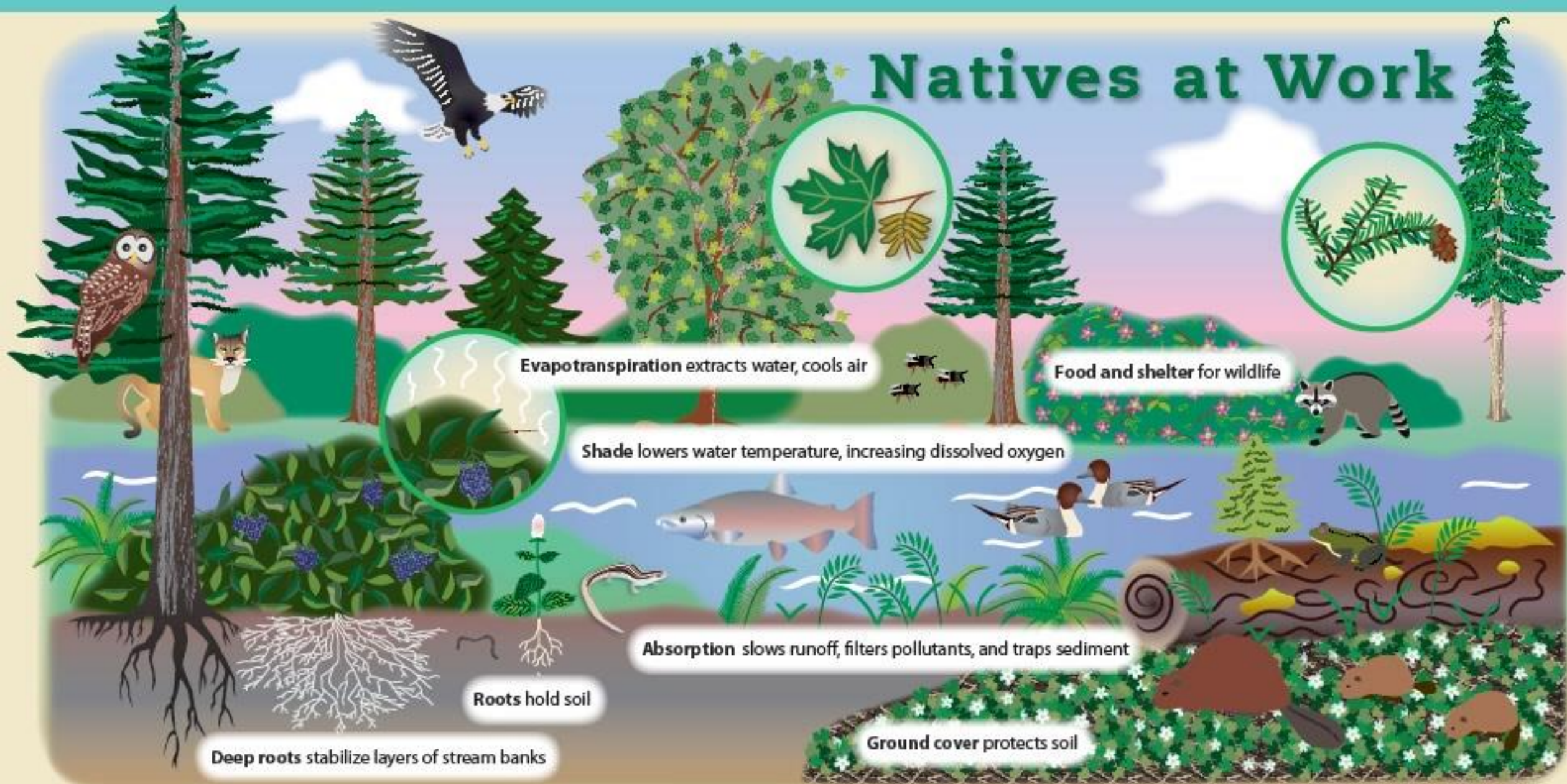


Resilience
Adapted to our climate,
pests, and diseases

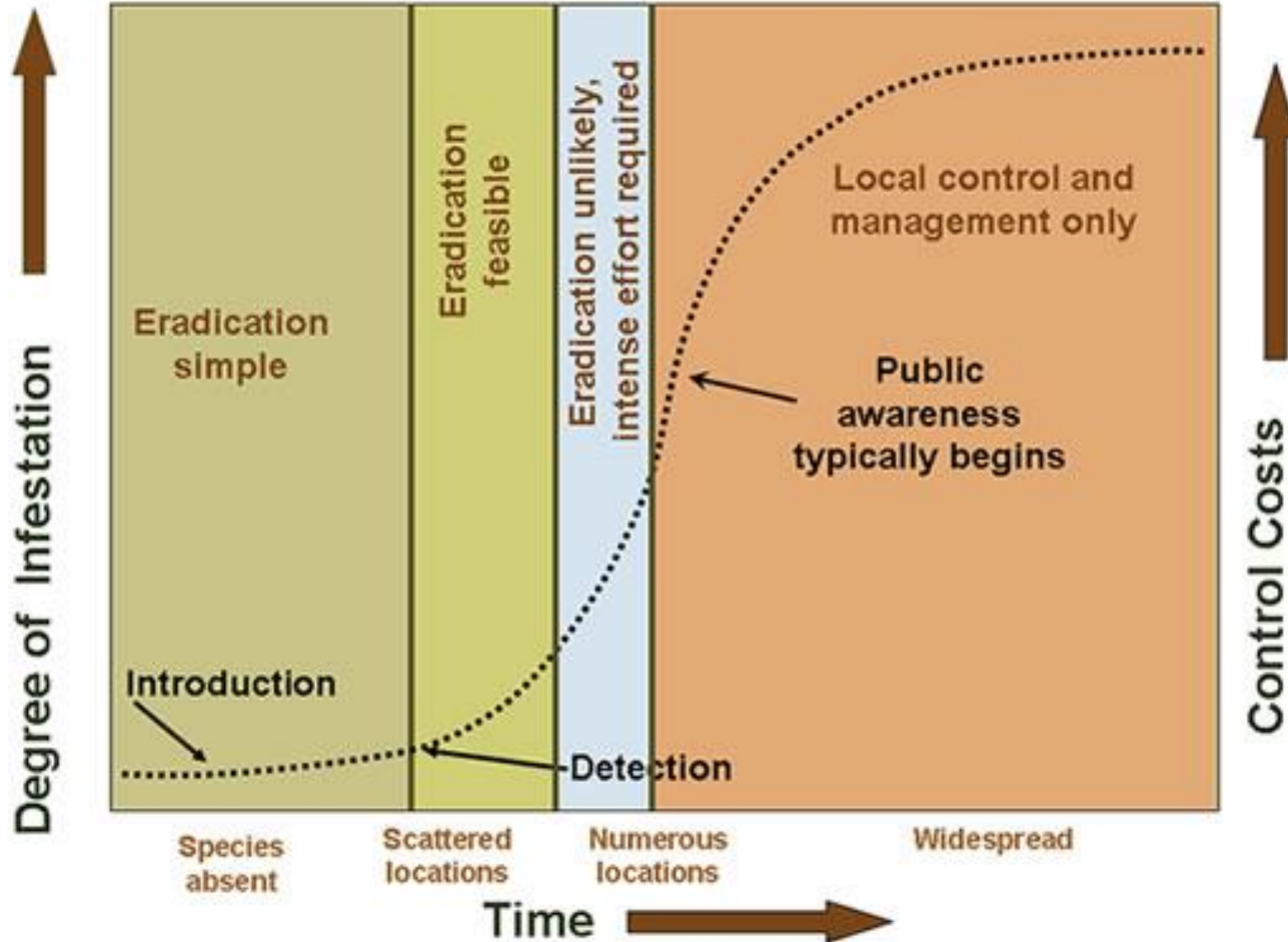
“SPECIES INVASION IS PROBABLY THE SECOND MOST IMPORTANT CAUSE, BEHIND HABITAT LOSS, OF THE OVERALL DECLINE IN BIODIVERSITY AND CHANGING COMPOSITION OF RIPARIAN COMMUNITIES.”

---NAIMAN, ET. AL

Natives at Work



Invasion Stages Through Time



UNDERSTAND
THE RISK....

Clark Fork River, Milltown Dam Site, Planting Areas



AGRICULTURAL ESCAPEES

- REED CANARYGRASS (*PHALARIS ARUNDINACEA*)
- 'GARRISON' CREEPING FOXTAIL (*ALOPECURUS ARUNDINACEUS*)
- CREEPING BENTGRASS (*AGROSTIS STOLONIFERA*) (ALSO REFERRED TO AS REDTOP)
- SMOOTH BROME (*BROMUS INERMIS*)
- ORCHARDGRASS (*DACTYLIS GLOMERATA*)
- QUACKGRASS (*ELYMUS REPENS*)
- CHEATGRASS (*BROMUS TECTORUM*)
- BULBOUS BLUEGRASS (*POA BULBOSA*)



orchardgrass
www.Gunnison.colostate.edu



smooth brome
www.Gunnison.colostate.edu



quackgrass
www.Gunnison.colostate.edu

UGA1459496

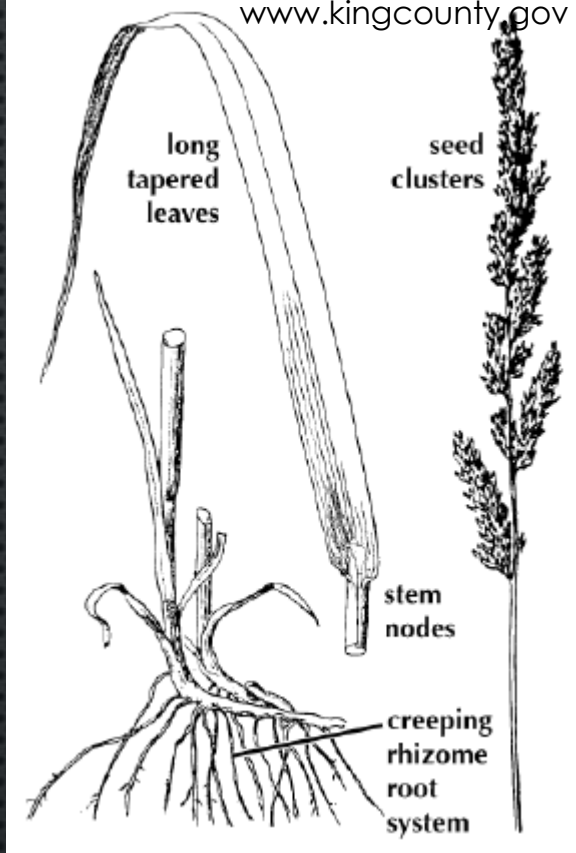
ORNAMENTAL ESCAPEES

- RUSSIAN OLIVE (*ELAEAGNUS ANGUSTIFOLIA*)
- SIBERIAN ELM (*ULMUS PUMILA*)
- NORWAY MAPLE (*ACER PLATANOIDES*)
- CRACK WILLOW (*SALIX FRAGILIS*) &
WHITE OR GOLDEN WILLOW (*SALIX ALBA*)
- SALT CEDAR (*TAMARIX SPP.*)
- BUCKTHORN (*RHAMNUS CATHARTICA*)



Russian olive and Siberian elm,
Clark Fork River at Missoula

*Many ornamental invasive escapees are forb species that are listed as noxious weeds.



REED CANARYGRASS (*PHALARIS ARUNDINACEA*)



Native origin: Eurasia
Introduced as: Forage and erosion control

REED CANARYGRASS - ECOLOGICAL THREAT

- FORMS DENSE, HIGHLY PRODUCTIVE MONOCULTURES THAT SPREAD RADIALLY
- REPRODUCES BY FLOATING PROPAGULES, SEEDS, AND RHIZOMES
- 74% OF NEW SHOOTS ORIGINATE FROM RHIZOMES
- PRODUCES DENSE RHIZOMATOUS MATS UP TO $\frac{1}{2}$ METER THICK
- CREATES PERSISTENT SEED BANK WITH HIGH RATE OF VIABILITY UP TO 97%



Kootenai River, Idaho





Monotype



UNDERSTAND THE THREAT

- HYDROLOGY
- TOPOGRAPHY
- LAND USE
- DISTURBANCE
REGIME



Component or
early infestation?





Natural Recruitment Area





REED CANARYGRASS CONTROL

- **EXCAVATION AND GRADING**—CREATE ROUGH SURFACES WITH COARSE SUBSTRATE AT ELEVATIONS MOST SUITABLE FOR DESIRABLE SPECIES.
- **BURNING**—SPRING BURNING FOLLOWED BY HERBICIDE APPLICATION IN THE FALL.
- **HERBICIDE**—GLYPHOSATE APPLICATION AFTER MOWING IN LATE SUMMER.
- **BORON**—REED CANARYGRASS IS SENSITIVE TO HIGHER LEVELS OF BORON, AND OTHER GRASSES ARE LESS SENSITIVE; POTENTIAL TO TEST SOIL OR FOLIAR APPLICATIONS.
- **CARBON**—INCREASE C:N RATIO TO 10:1 TO LIMIT REED CANARYGRASS, USING WOOD MULCH, SAWDUST OR ACTIVATED CARBON. SOME BARK MULCHES ALSO HAVE ALLELOPATHIC PROPERTIES.
- **COMPETITIVE EXCLUSION**—AGGRESSIVE REVEGETATION WITH DESIRED SPECIES TO OCCUPY NICHES BEFORE REED CANARYGRASS CAN BECOME ESTABLISHED.
- **SUFFOCATION** — PLACEMENT OF SOLARIZATION OR OTHER BARRIER TO HEAT-KILL PLANTS AND ROOTS, DOES NOT NECESSARILY ELIMINATE SEED BANK.

Therriault Creek, Montana



Biomass reduced, roots killed



Seed heavily with native grasses

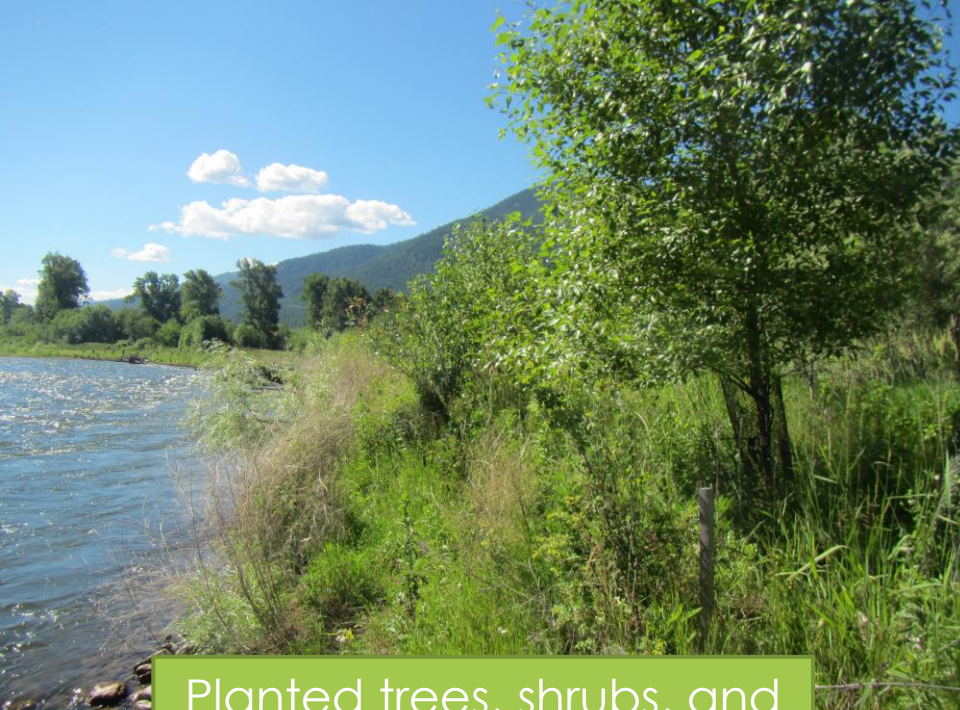


Site dominated by native bluejoint reedgrass

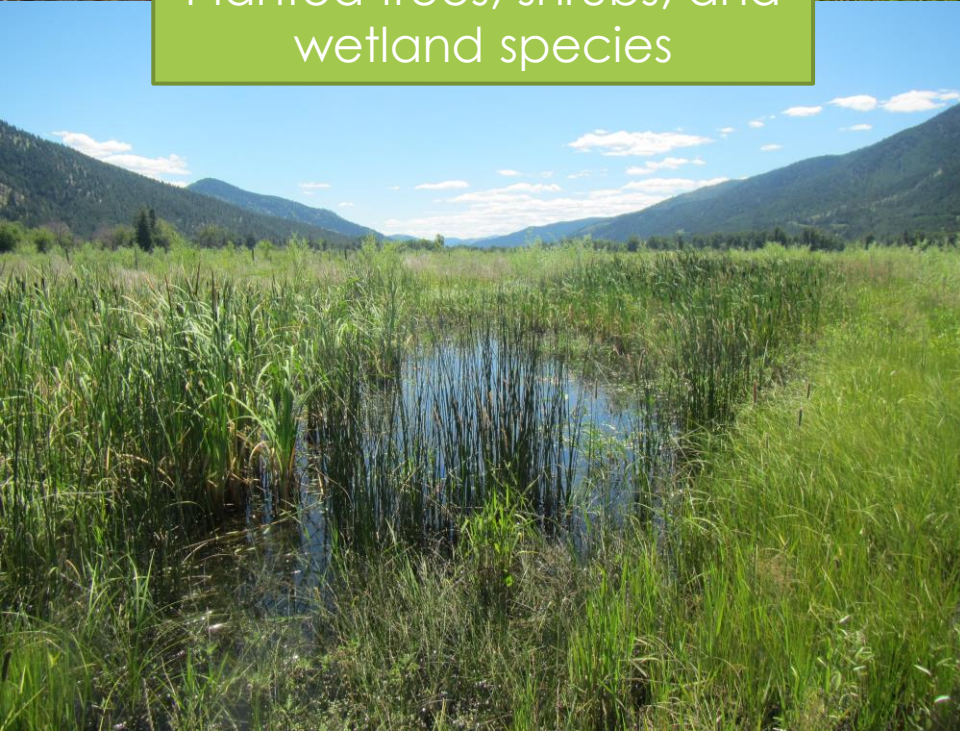


SUFFOCATION

- LEAVE IN PLACE MINIMUM 3 YEARS
- AGGRESSIVELY REVEGETATE AFTER REMOVAL
- APPLY HERBICIDE TO SMALL RE-SPROUTS
- WAIT TO PLANT WOODY VEGETATION UNTIL AFTER FABRIC HAS BEEN REMOVED



Planted trees, shrubs, and wetland species



REDUCE RISK

- CREATE TOPOGRAPHIC DIVERSITY
- AGGRESSIVELY REVEGETATE WHERE THREAT IS HIGHEST



Constructed swales and wetlands



CREeping BENTGRASS (REDTOP) (*AGROSTIS STOLONIFERA*)



Native origin: Europe, North Africa, Northern and Central Asia
Introduced as: Forage prior to 1750, naturalized

REDTOP - ECOLOGICAL THREAT



Dominant species in slickens treated with lime

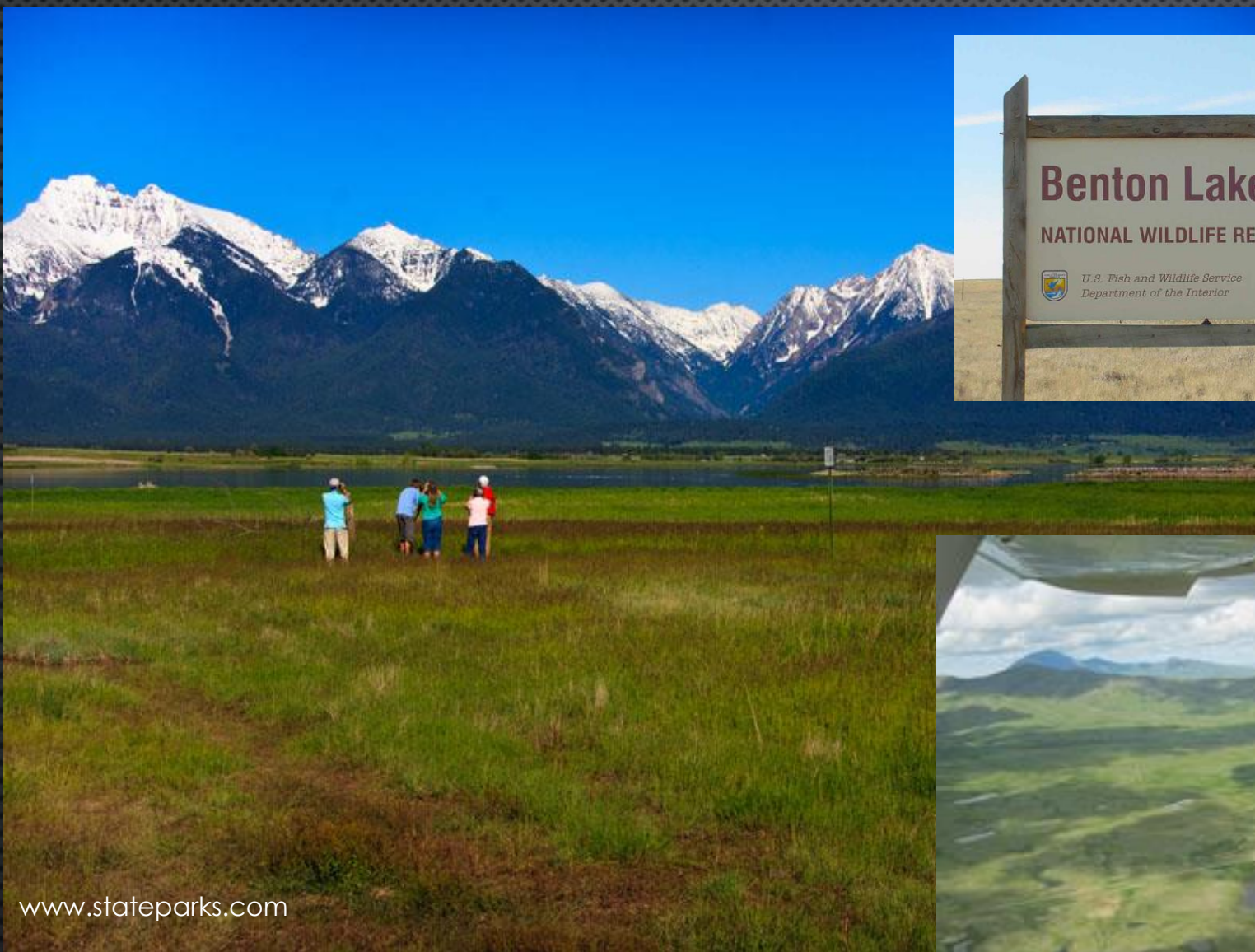


Can easily dominate herbaceous layer

GARRISON CREEPING MEADOW FOXTAIL (*ALOPECURUS ARUNDINACEUS*)



Native origin: Eurasia
Introduced as: Forage



www.stateparks.com



Creeping Meadow Foxtail
invading wet meadow



K. Ramstead



USFWS

GARRISON CREEPING MEADOW FOXTAIL – ECOLOGICAL THREAT

GARRISON CREEPING MEADOW FOXTAIL – ECOLOGICAL THREAT



Silverbow Creek, Clark
Fork River tributary



RUSSIAN OLIVE (*ELAEOAGNUS ANGUSTIFOLIA*)



Native origin: Asia and southern Europe

Introduced as: Ornamental shade tree, wildlife, windbreak, erosion control



RUSSIAN OLIVE – ECOLOGICAL THREAT

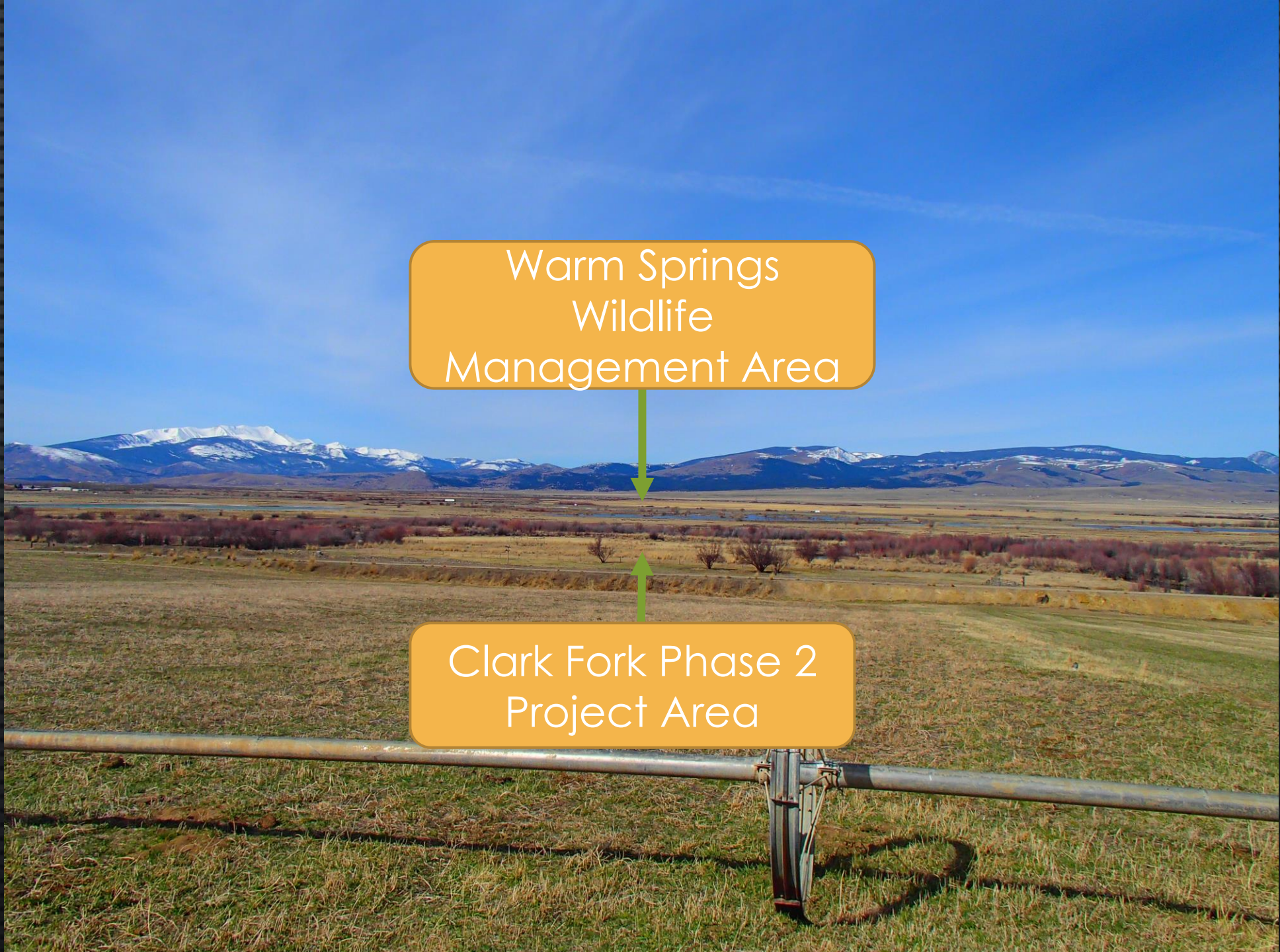
- EASILY OUTCOMPETES NATIVE WOODY SPECIES LIKE COTTONWOOD AND WILLOW
- CAN TOLERATE LARGE AMOUNTS OF SALINITY AND GROW IN A WIDE RANGE OF SOIL TYPES
- CAN ABSORB NITROGEN INTO ITS ROOTS
- FRUITS ARE A GREAT SOURCE OF FOOD FOR BIRDS, BUT BIRD SPECIES RICHNESS IS GREATER WHERE NATIVE SPECIES HAVE HIGHER COVER
- CAN INCREASE USE OF NATIVE SPECIES

Warm Springs Wildlife Management Area Warm Springs, Montana



Warm Springs
Wildlife
Management Area

Clark Fork Phase 2
Project Area



RUSSIAN OLIVE: ECOLOGICAL THREAT

Can
this?

Become
this?



Russian Olive

Big Horn River, southeastern Montana



“Forty years ago when these were planted, we just didn’t know what was going to happen... they were not managed and now there is just a massive blowout.”



CRACK WILLOW (*SALIX FRAGILIS*)



Native origin: Eurasia
Introduced as: Fast-growing
ornamental



CRACK WILLOW ECOLOGICAL THREAT

- SPREADS EASILY FROM SOURCE AND CAN FORM PURE STANDS
- HYBRIDIZED EXTENSIVELY WITH GOLDEN WILLOW (*SALIX ALBA*)



Threemile Creek,
Bitterroot River



Establishes along ditches



Can dominate some natural riparian areas

Deer Creek, Clark Fork River tributary,
Milltown Dam Site



NORWAY MAPLE (*ACER PLATANOIDES*)



Native Origin: Europe
Introduced as: Ornamental
shade tree in 1756

NORWAY MAPLE: ECOLOGICAL THREAT

- DISPLACES NATIVE TREES AND HAS THE POTENTIAL TO DOMINATE A LANDSCAPE.
- A MAJOR PROBLEM IN THE NORTHEAST AND NORTHWEST WHERE IT DISPLACES NATIVE MAPLES LIKE THE SUGAR MAPLE AND ITS DENSE CANOPY SHADES OUT NATIVE UNDERSTORY VEGETATION.



Rattlesnake Creek, Greenough Park, Missoula

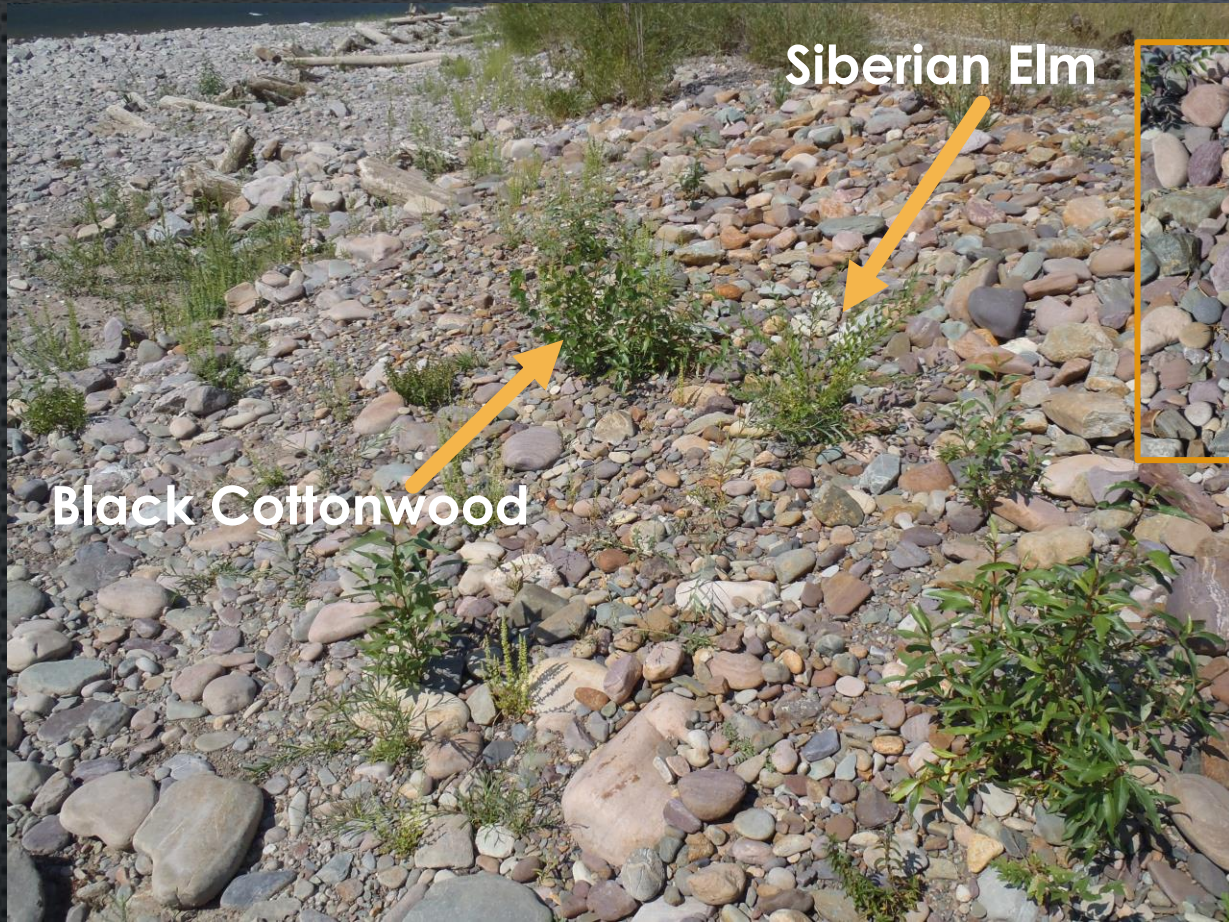


SIBERIAN ELM (*ULMUS PUMILA*)



Native Origin: Northern China,
Siberia, Manchuria, Korea
Introduced as: Ornamental shade
tree





Siberian Elm

Black Cottonwood



Clark Fork River, Missoula

Clark Fork River, Milltown Dam site



WOODY INVASIVE SPECIES MANAGEMENT

- MANUAL/
MECHANICAL
- HERBICIDE
- COMBINATION

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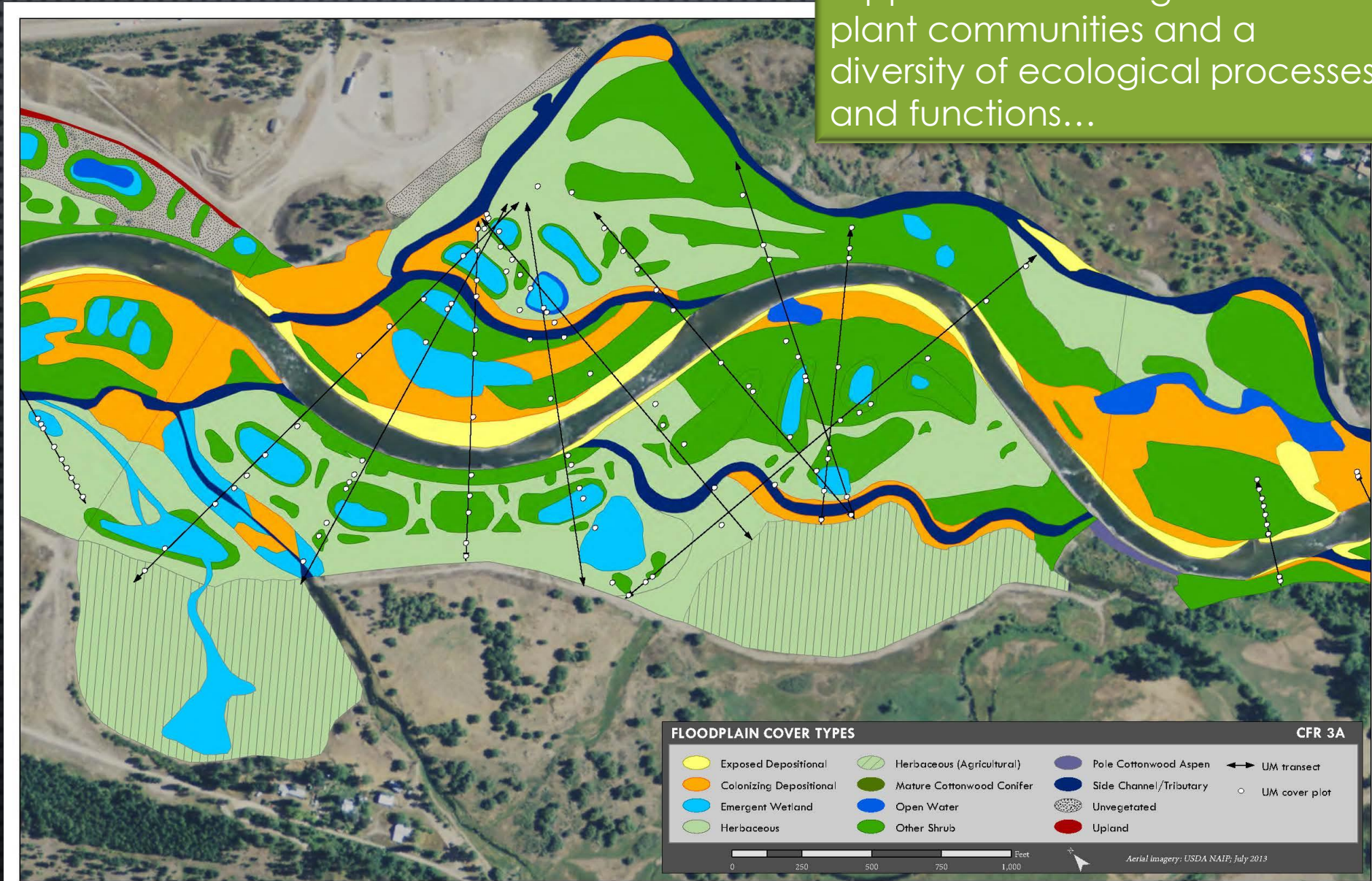


WHAT IS THE BASELINE?

Design to create conditions to support a wide range of native plant communities and a diversity of ecological processes and functions...

“RESTORE INJURED RESOURCES TO THEIR BASELINE CONDITION....”

WHERE DO INVASIVE SPECIES FIT IN THE BASELINE CONDITION?



WHERE DO WE GO FROM HERE?

- KNOW WHAT SPECIES ARE A THREAT AND WHERE THEY OCCUR
- UNDERSTAND THE THREAT
- EARLY DETECTION AND PREVENTION
- PRIORITIZED MANAGEMENT

"If one tribble is producing an average litter of ten every twelve hours over a period of 3 days... 1,771,561 tribbles!"

